

has the structure of the second embodiment and the modem **105** outputs the control signal SN- i ($i=1, 2, \dots, N-1$).

The power control signal SN- i is inputted to a low pass filter **401- i** ($i=1, 2, \dots, N-1$) associated with each terminal. A radio frequency signal varying with a frequency higher than needed is removed therein. Thereafter, the power control signal SN- i is converted to a signal corresponding to an inverse number of the signal-to-noise ratio value in an inversion unit **402- i** ($i=1, 2, \dots, N-1$).

Outputs of the above described inversion units **402- i** are added up in an adder **403**. Thereafter, a resultant sum is subjected to inversion again in an inversion unit **404**. The output of the inversion unit **404** is supplied to a multiplier **405- i** ($i=1, 2, \dots, N-1$) and multiplied by the output of the inversion unit **402- i** ($i=1, 2, \dots, N-1$). A result of this multiplication is outputted as the transmission power specifying signal PW- i ($i=1, 2, \dots, N-1$) of each terminal.

In this case, the signal PW- i for specifying the transmission power represents a weighting function for transmission power. As the signal-to-noise ratio value of a terminal becomes lower, the value of the signal PW- i is determined so as to make the transmission power higher than that of other terminals.

The above described transmission power specifying signal PW- i is supplied to the modem **105- i** associated with it and shown in FIG. 4. In the modem **105- i** , the transmission power specifying signal PW- i is inputted to an amplifier **204** of a transmission circuit system. As a result, the transmission signal is outputted with power depending upon the state of the signal-to-noise ratio of each terminal.

In the configuration heretofore described, the pilot signal transmitted from the base station and transmission signal (data signal) transmitted from the base station to each terminal have the same frequency band and they are transmitted at the same time point. Therefore, attenuation caused in the received data signal of each terminal according to the distance from the base station is equal to attenuation caused in the pilot signal. Furthermore, noise caused in the pilot signal is equal to that caused in the data signal.

As in the above described embodiment, therefore, each terminal measures the signal-to-noise ratio on the basis of the received power of the pilot signal and noise power extracted at that time by using the orthogonal code for the signal-to-noise ratio measurement and transmits the signal-to-noise ratio as the power control signal (PC or SN). On the basis of the power control signal, the base station controls transmission of the data signal for each terminal with transmission power inversely proportionate to the signal-to-noise ratio. Thereby, the signal-to-noise ratio of received signals in terminals can be made equal.

The pilot signal is not subjected to power control in the base station. As compared with the signal-to-noise ratio calculated from the data signal and the noise signal varied under the influence of power control, therefore, the signal-to-noise ratio calculated from the pilot signal and the noise signal becomes an excellent power control signal.

FIG. 6 shows effects obtained when transmission power control is exercised so as to make the signal-to-noise ratios in terminals equal.

In accordance with the present invention, power control is exercised so as to make the transmission power of a signal directed to a terminal B located near the base station than the transmission power of a signal directed to a terminal A located near the boundary of a cell. Therefore, received power values of the signals at the terminals A and B become as represented by **920** and **922**, respectively.

The above described power control is exercised similarly in cells adjacent to each cell as well. Control is exercised in such a direction as to decrease the total transmission power of each base station. In each cell, therefore, power of jamming signals from adjacent cells is decreased. The received power of interference transmitted from base stations of other cells and arriving at the terminal located near the base station is reduced as represented by **921**. The received power of interference arriving at the terminal located near the boundary of the cell is reduced as represented by **923**.

In a spread spectrum communication system having such a structure that hexagon cells, for example, are repetitively disposed, the effect of this power reduction corresponds to approximately 7.4 dB.

Furthermore, by an amount of reduction in power of interference, the number of terminals capable of communicating simultaneously in each cell (the number of terminals accommodated by the base station) can be increased. The number can be increased to approximately 5.5 times at its maximum that of the conventional technique. Since the above described power control is open loop control, stable control is exercised.

FIG. 7 shows a third embodiment of the terminal.

In this embodiment, a first signal-to-noise ratio measuring unit **316** and a second signal-to-noise ratio measuring unit **326** are combined.

The first signal-to-noise ratio measuring unit **316** derives signal-to-noise information from the pilot signal in the same way as the signal-to-noise measuring unit shown in FIG. 2.

The second signal-to-noise measuring unit **326** derives signal-to-noise information from the data signal addressed to the terminal.

That is to say, the transmission signal addressed to the terminal de-spreaded in a multiplier **307** with an orthogonal code W_i is integrated in an accumulator **308** over a predetermined period of time. The output of the accumulator **308** is inputted to a decoder **309**. The output of the accumulator **308** is inputted to a square unit **325** as well to derive power of the received signal. This power of the received signal is supplied to the signal-to-noise ratio measuring unit **326** as a second input.

To a first input of the second signal-to-noise ratio measuring unit **326**, power of the noise signal de-spreaded with an orthogonal code W_N and outputted from a square unit **312** is supplied. As a result, the signal-to-noise ratio of the received signal is derived.

Signal-to-noise information of these two kinds is multiplexed in a multiplexer **327** with transmission data and transmitted via an encoder **318**, a multiplier **320**, a radio frequency circuit **321**, a circulator **302**, and an antenna **301**. Alternatively, the difference with respect to a reference signal-to-noise ratio may be transmitted to the base station as the power control signal PC in the same way as the first embodiment.

FIG. 8 shows the configuration of the transmission power controller **106** in the base station of the case where each terminal has the configuration of the above described second embodiment.

In the base station, each modem **105- i** separates and outputs power control signals of two kinds transmitted by the terminal, i.e., the signal-to-noise ratio (SN- i_p) of the pilot signal and the signal-to-noise ratio (SN- i_d) of the received signal.

From the signal-to-noise ratio SN- i_p ($i=1, 2, \dots, N-1$) of the pilot signal, a first weighting function of transmission